REMARKS

Reconsideration of this application, as presently amended, is respectfully requested. Claims 1 - 23 are pending in the present application. Claims 1 – 23 stand rejected.

Claim Rejections – 35 U.S.C. §103

Claims 1, 2, 5 – 7, 9 – 12, 17, 18 and 23 were rejected under 35 U.S.C. §103(a) as being unpatentable over **Ouderkirk** (U.S. Patent No. 6,124,971) in view of **Sonoda et al.** (U.S. Patent No. 5,880,796).

Claims 13 – 16 and 20 – 22 were rejected under 35 U.S.C. §103(a) as being unpatentable over **Ouderkirk** in view of **Sonoda**, as applied to claims above, and further in view of Liquid Crystals, Applications and Uses, Volume 1, by Birenda Bahadur et al. (Bahadur) 1990, (Chapters 7 and 10, especially pages 180, 242, 245, and 270).

Claims 3, 4, 8 and 19, were rejected under 35 U.S.C. §103(a) as being unpatentable over **Ouderkirk** in view of **Sonoda** as applied to claims above, and further in view of **Hisatake et al.** (U.S. Patent No. 5,721,858).

For the reasons set forth in detail below, these rejections, to the extent they are considered to apply to the present claims, are respectfully traversed.

Initially, it is noted that the in rejecting the claims, the Examiner asserts that "specular" reflection, added by the amendment filed in response to the previous Office Action, does not mean light efficiency of nearly 100%. The term "specular" has been removed from the claims and independent claims 1 and 23 have been amended to define

the light efficiency as substantially 100% in a liquid crystal display device of the present invention.

More particularly, claims 1 and 23 have been amended to recite that "substantially all light.... is reflected by the reflection-type polarizing film... ." This amendment to claims 1 and 23 relates to the Examiner's recommendation regarding adding the feature of near 100% light utilization to define over the prior art, as was suggested by the Examiner during the personal interview with the Examiner conducted on August 11, 2004. It is submitted that the present amendment does not raise new issues requiring further consideration and/or search because the issue of 100% light utilization was considered in connection with the previous response filed August 12, 2004.

Support for the amendments to claims 1 and 23 is provided, for example, in the description of an embodiment of the invention wherein a color filter is disposed between an absorption-type polarizing film and a liquid crystal cell. Specifically, the present application page 11, lines 25-27, describes with respect to Fig. 10 "Consequently, the transmission axis of the absorption-type polarizing film 14 crosses that of the reflection-type polarizing film 16 at a right angle." Further, page 18, lines 5-13 and 21-24 of the specification describes "Since the linearly polarized light ... specular reflection by the reflection-type polarizing film 16. As the reflected light linearly polarized in yellow is sent back toward the visible side ..... can be indicated" and "substantially all light falling on the liquid crystal display panel 10, and colored, is reflected in regions for displaying information such as characters, enabling bright and colored display to be indicated in a metallic tone" [emphasis added].

Still further, page 19, lines 5-13, and particularly lines 8-11 of the specification, describes "... the transmission axis of the absorption-type polarizing film 14 is caused to be parallel with that of the reflection-type polarizing film 16, inverting the display condition described above by way of example, ..." [emphasis added].

Moreover, in accordance with another embodiment of the invention, wherein a dielectric multi-layer film is used as a color filter, the specification describes "Therefore, in display regions for information such as characters, substantially all incoming light components are reflected, indicating bright display in a metallic tone." [emphasis added] (see present application page 22, lines 24-26).

Still further, in accordance with another embodiment of the invention, wherein a color polarizing film as a color filter is disposed between an absorption-type polarizing film and a liquid crystal cell, the specification describes "It follows that in regions for characters and so forth for displaying information, substantially all the light component in yellow, falling on the liquid crystal cell 12, is reflected, indicating bright display in a colored (yellow) and metallic tone against the background part in a black or darker tone." [emphasis added] (see present application page 35, lines 8-12, and Fig. 19)

Furthermore, in accordance with another embodiment of the invention, wherein a color polarizing film as a color filter is disposed between a liquid crystal cell and a reflection-type polarizing film, the specification describes "Consequently, substantially all the colored light component after falling on the liquid crystal cell 12 will be reflected, outgoing to the visible side." [emphasis added] see present application page 37, lines 20-22, and Fig. 21).

Regarding the terminology "substantially all" in the description in the specification, which supports the present amendment, it is submitted that "all" is identical to "100%". Furthermore, "substantially" is often used in patent documents for the purpose of including adjacent values accepted under certain conditions. Accordingly, the meaning of "substantially all" is exactly the same as "nearly 100%".

When reflectance of the reflection-type polarizing film is 100%, the light efficiency in theory is maximum, i.e., 100%. In the liquid crystal display device of amended claim 1 or 23 of the present invention, for example, when information such as characters and background are displayed in a voltage applied area and a non-voltage applied area, respectively, in the liquid crystal cell, and when a transmission axis of the absorption-type polarizing film crosses that of the reflection-type polarizing film at a right angle, a light linearly polarized and colored by the absorption-type polarizing film and the color filter does not change its polarizing direction in the region for displaying the information, so that all (100%) of the linearly polarized light can be reflected to a visible side by the reflection-type polarizing film. In the background region, a light linearly polarized and colored is changed its polarizing direction to right angle by the liquid crystal cell, so that all the light transmits through the reflection-type polarizing film, thereby no reflection (0%) of light from the reflection-type polarizing film to the visible side occurs.

The light transmitted through the reflection-type polarizing film is all absorbed by an absorbing member, and then turns black or different color. This makes the contrast of colors of two regions maximum. In other words, 100% of incoming light to the reflection-type polarizing film

is utilized. Furthermore, when transmission axes of both polarizing films are disposed in parallel with each other, contrary to the above, 100% of light colored by the reflection-type polarized film is reflected in the background region, but not reflected in the character region. Also, in this case, the contrast of colors of two regions can be maximum and the light efficiency is 100%.

Please note, an ordinary "liquid crystal display device" has a structure that incoming light is divided into two components (e.g., two linearly polarized components whose polarizing directions are orthogonal and strengths are 50%) in which one component displays characters and the other displays background, and information is displayed with the visual contrast of the display with both components. The structure is essential in order to display information changing every moment. Therefore, reflecting nearly 100% of one component of incoming light with the reflection-type polarizing film means that utilizable light component is utilized at a maximum (nearly 100%).

A dial having a color film and a display plate of an analog watch, as disclosed in **Sonoda** performs only metallic reflection, therefore light efficiency may be 50% or more of total incoming light. However, only fixed characters or patterns are displayed, but not changing information, so that it is not necessary to divide the incoming light into two components and all energy of the incoming light can be utilized in any region of a dial. The structure of **Sonoda** is therefore capable of bright metallic display, but cannot display changing information and only performs coloring of the dial.

In a liquid crystal display device, as explained above, only half energy of the incoming light can originally be utilized in each of the regions for characters and background. This is why

improvement in brightness or contrast of display has been desired for a long time.

There used to be an LCD with a color filter in which polarizing films on both sides of a liquid crystal cell are absorption type. For example, **Bahadur**, which does not disclose a reflection-type polarizing film reflecting light to a visible side, is considered to disclose conventional art based on a structure including only a liquid crystal cell, a color filter, and two absorption-type polarizing films.

If such the liquid crystal display device were used as reflection-type LCD, light would transmit an absorption-type polarizing film on the back side twice there and back since colored light has energy which is only a part of energy of incoming light (white), and moreover, colored light is reflected at a reflector provided on the further back side of the absorption-type polarizing film on the back side of a liquid crystal cell and then returns to a visible side. In that case, light strength would be remarkably low due to absorption of light. Furthermore, reflectance of a reflector on the back side is not high in general. Particularly, if the reflector on the back side was a transflective reflector combined with a backlight, reflectance is further remarkably low and therefore a colored light returned to the visible side is weaker and darker. It cannot be used as a reflection-type LCD and in such LCD, bright display cannot be performed without lighting a backlight all the time. A backlight is indispensable in a conventional color LCD using only an absorption-type polarizing film such as a **Bahadur**-type LCD.

In contrast to the prior art, in an LCD of the present invention substantially 100% of polarized and colored light is reflected at a surface of a reflection-type polarizing film and then returned to a visible side (no matter how low the reflectance of a transflective reflector on the back

side of the reflection-type polarizing film is). Thus, the LCD of the present invention can perform color display with high contrast by use of colored reflection light, which is extremely bright.

Consequently, the LCD of the present invention, using a reflection-type polarizing film and a color filter, is effective in producing an unexpectedly bright color display compared to the conventional art. Furthermore, the present invention has improved quality of color display by an LCD, which used to be a big problem.

In the Office Action, the Examiner asserts that **Sonoda** teaches that a color filter is disposed on a visible side to provide an optional display with a color metallic impression to improve tastefulness and to increase a product value. Firstly, as explained above, **Sonoda** only discloses a structure to color a metal surface of a member having a fixed display (patterns or the like), and does not teach a means for displaying changing information with bright color in a display device, which does not include a member with metal surface. For the reasons set forth above, **Sonoda** is not an appropriate reference.

Secondly, in the Examiner's response to the previous patentability arguments, the Examiner states that a specular reflection-type polarizer typically has something less than 50% reflection because it passes one of the two polarization states. This statement is interpreted to mean that reflection of a reflection-type polarizing film will never be more than 50%, so that it cannot be possible to utilize 100% of incoming light. However, as explained above, a liquid crystal display device displays an information region by use of half component of incoming light and displays a background region by use of the other half thereof. It is impossible, as a matter of course, to reflect all light incoming from a visible side of an absorption-type polarizing film in a region in

an LCD. If the reflection-type polarizing film reflected nearly all colored light incoming in one region, 100% of utilizable incoming light could be utilized.

In the original description and claims of the present application, the reflection-type polarizing film is clearly defined as transmitting the light linearly polarized in the direction parallel to the transmission axis of thereof and reflecting the light linearly polarized in the direction orthogonal to the transmission axis of thereof (see present application, page 11, lines 8-13, and claim 1).

In view of the above amendments and remarks, it is respectfully submitted that none of the prior art discloses or suggests the features recited independent claims 1 and 23, wherein light efficiency is substantially 100%.

***Prima facie* case of obviousness has not been established**

It is respectfully submitted that there is no motivation or incentive to combine **Ouderkirk et al.** with **Sonoda et al.** and therefore the combination is improper under §103

The Office Action asserts that "Ouderkirk discloses ... all of the elements of claims 1, 2 and 23, *except the color filter disposed on the visible side of the absorption-type polarizing film or between the absorption-type polarizing film and the reflection-type polarizing film*" (Office Action, page 2, item 2, lines 4 – 7).

Thus, the Examiner clearly recognizes that **Ouderkirk et al.** *does not* teach a color filter arranged, as claimed, in the optical path of an absorption-type polarizing film and a reflection-type polarizing film (i.e., on the visible side of the absorption-type polarizing film (claim 23) or

disposed between the absorption-type polarizing film and the reflection-type polarizing film (claim 1)).

The Examiner asserts that **Sonoda et al.** teaches the elements missing from **Ouderkirk et al.** Specifically, the Office Action states:

> Sonoda teaches numerous displays including LCD displays, and in Figure 11 Sonoda teaches that a color film, 114 (Applicant's color filter), may be disposed on the visible side of a display (Applicant's visible side of the absorption-type polarizing film, not patentably distinct from Applicant's disposed between the absorption-type polarizing film and the reflection-type polarizing film) to provide a color metallic impression to improve tastefulness and to increase a product value. (Office Action, page 3, line 19 – page 4, line 2).

Thus, based on the Examiner's comments regarding **Sonoda et al.**, because the Examiner has not pointed out where the specific claimed features are disclosed in **Sonoda et al.**, the Examiner apparently recognizes that although **Sonoda et al.** teach a color film 114, **Sonoda et al.** do not disclose or suggest a color filter arranged as claimed. Specifically, **Sonoda et al.** do not disclose or suggest a color filter arranged in a liquid crystal display device having a liquid crystal cell, an absorption-type polarizing film, and a reflection-type polarizing film, the color filter

arranged on the visible side of the absorption-type polarizing film (claim 23), or disposed between the absorption-type polarizing film and the reflection-type polarizing film (claim 1).

In fact, **Sonoda et al.** merely teach a color film 114 used as a ***background*** for the hands of an analog watch face. Briefly reiterating, **Sonoda et al.** discloses a background for the face of an analog watch. The watch face includes watch hands 107 and a metallic display plate 109 having openings 113 behind the watch hands 107. A light-emitting member 108 beneath the display plate 109 in combination with a color film 114 above the display plate 109 provides the watch face with a color metallic impression. More particularly, the light-emitting member 108 shines light upward through the openings 113 of the plate 109 and through the color film 114 such that the display plate 109 has a color metallic impression to it.

In view of the fact that the color film 114 of **Sonoda et al.** is not used in an LCD and is not arranged with respect to a liquid crystal cell, an absorption-type polarizing film and a reflection-type polarizing film, *what then is the requisite motivation to combine* ***Sonoda et al.*** *with* ***Ouderkirk et al****?*

In rejecting claims under §103, the Examiner must provide a reason why one having ordinary skill in the relevant art would have been led to combine the prior art references to arrive at the claimed invention. Such reason supporting the combination must stem from some teaching, suggestion, or incentive in the prior art as a whole or knowledge generally available to one having ordinary skill in the art (knowledge generally available to one having ordinary skill in the art is typically demonstrated by a reference). However, where no reasonable teaching, suggestion or

incentive exists for the proposed combination, a *prima facie* case of obviousness will not have been established. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1051, 5 USPQ 2d 1434, 1438 (Fed. Cir.), *Cert. denied*, 488 U.S. 25 (1988).

The Examiner seems to assert that because **Sonoda et al.** teach LCD displays as well as the analog display in the embodiment applied against the claims (Fig. 11), this is motivation for using the color film 114 in an LCD (see Office Action, page 3, line 19). Contrary to the Examiner's assertion, the fact that **Sonoda et al.** teach LCD displays, ***none of which include a color film***, *is clearly evidence that* ***Sonoda et al.*** *does* ***not*** *suggest or even contemplate using a color film in an LCD device*, and is therefore disincentive for the combination.

Moreover, **Sonoda et al.** teaches the color film 114 as part of a background for analog watch hands and teaches absolutely nothing regarding the position of the color film with respect to an absorption-type polarizing film and a reflection-type polarizing film, which are elements of the claimed LCD. Further, contrary to the Examiner's assertion, the color film 114 is not positioned on the visible side of the analog watch hands 107.

The only other motivation provided for combining the references is "*to provide a color metallic impression to improve a tastefulness and to increase product value regardless of the display type, e.g., mechanical, LCD, electrochromic, etc.*" (see Office Action, page 4, line 5 - page 5, line 2).

However, in order to achieve the benefits of a color metallic impression, improved tastefulness, and increased product value, **Sonoda et al.** clearly teach that the light-emitting member 108, the display plate 109 and the color film 114 are *all required in combination* (see

Sonoda et al., col. 8, lines 1-12 and lines 36-56). In other words, **Sonoda et al.** teach that it is the combination of these elements that achieves the color metallic impression, the improved tastefulness and the increased product value, and not any one element alone.

Despite the teachings noted in the paragraph above, the Examiner has selected to combine only the color film 114 of **Sonoda et al.** with the **Ouderkirk et al.** device. It is respectfully submitted that this is improper under §103.

More specifically, it is well established that it is impermissible within the framework of §103 to pick and choose from any one reference only so much of it as will support a given position to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggest to one of ordinary skill in the art. *In re Mercer*, 515 F.2d 1161, 1165-66, 185 USPQ 774, 778 (CCPA 1975).

In ascertaining the differences between the prior art and the claims (the second factual inquiry of *Graham v. John Deere Co.*), it is essential to view the claims at issue as "*the invention as a whole*, without the benefit of hindsight vision afforded by the claimed invention." *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n. 5, 229 USPQ 182, 187 n. 5 (Fed. Cir. 1986).

It is respectfully submitted that if the Examiner properly considers the teachings of **Sonoda et al.**, without the benefit of the hindsight of applicant's teachings, there is no teaching, suggestion, motivation or incentive provided in the reference to separate the color film114 from the metallic plate 109 and light source to achieve a color metallic impression.

Further, it is respectfully submitted that if the combination of metallic plate 109 and color

film 114 as taught by **Sonoda et al.** were combined with the **Ouderkirk et al.** device, the function of the **Ouderkirk et al.** device would be destroyed. Specifically, because the display plate 109 reflects the incident light regardless of its polarized direction in the area other than the outgoing opening 113, and transmits the light incident to the outgoing opening 113, the display of **Ouderkirk** would not function properly.

Finally, in making a determination of obviousness under §103, the Examiner must consider the advantages of an invention. More specifically, it is impermissible to ignore the *advantages*, properties, utilities, and unexpected results flowing from the claimed invention; they are part of the invention as a whole. *In re Wright*, 848 F.2d 1216, 6 USPQ2d 1959 (Fed. Cir. 1988).

The presently claimed invention provides the advantage of coloring either information, such as numbers and characters or the background, with strong contrast so that one or the other is colored in dark color or different color, thereby the contrast of the two bright colors being observed. Neither **Ouderkirk et al.** nor **Sonoda et al.** disclose or suggest achieving these advantages or a structure to achieve these advantages. **Ouderkirk et al.** teaches a black and white display. **Sonoda et al.** teach a fixed color-metallic display background. Neither suggest the advantages of the present invention.

Therefore, in view of the above remarks, it is respectfully submitted that neither **Ouderkirk et al.** nor **Sonoda et al.**, whether taken alone or in combination, disclose, suggest or render obvious the presently claimed invention. Further, it is respectfully submitted that there is no motivation or incentive to combine the **Ouderkirk et al.** and **Sonoda et al**. references, except

that provided by applicants' own teachings, and therefore the combination is the result of improper hindsight reconstruction of the claimed invention based on applicants' teachings.

The Dependent Claims

With respect to the rejections of the dependent claims, the Examiner has apparently failed to address applicant's response to these rejections. Of particular note is the Examiner's failure to address the response to the rejections of claims 17 and 18, which were specifically discussed in the previous response.

Therefore, the remarks with respect to the dependent claims from the previous response are hereby incorporated by reference. It is respectfully requested that the response to these rejections be addressed, particularly claims 17 and 18, as is required under the rules (37 C.F.R 1.104).

CONCLUSION

For the reasons set forth in detail above, it is respectfully submitted that all pending claims are in condition for allowance. An indication of allowability of all pending claims is respectfully requested.

If the Examiner believes that there are issues remaining to be resolved in this application, the Examiner is invited to contact the undersigned attorney at the telephone number indicated below to arrange for an interview to expedite and complete prosecution of this case.

In the event that any fees are due in connection with the filing of this paper, please charge any fees to Deposit Account No. 50-2866.

Respectfully submitted,

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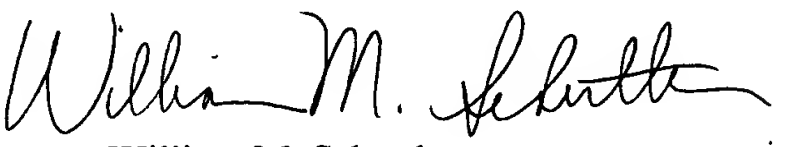

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